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EXAMINER
YR135

ART UNIT
1702

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

08/900,254

Applicant(s)

Pfenffer

Examiner

Yao

Group Art Unit

1733

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Response

A SHORTENED STATUTORY PERIOD FOR RESPONSE IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a response be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for response is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to respond within the set or extended period for response will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- ☒ Responsive to communication(s) filed on 2-17-99
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-4 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-4 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been received.
- ☐ received in Application No. (Series Code/Serial Number) _____.
- ☐ received in this national stage application from the International Bureau (PCT Rule 1.7.2(a)).

*Certified copies not received: _____

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☒ Interview Summary, PTO-413
- ☒ Notice of References Cited, PTO-892
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Other _____

Office Action Summary

Art Unit: 1733

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al (US 4,496,583) in view of either (Meyer (US 5,232,595) or Narou et al (US 4,876,007)) and Norton (US 2,862,542).

Yamamoto et al discloses a method of forming a paper-like polyester sheet having an enhanced filtering property, the method comprises blending undrawn polyester fibers with drawn polyester fibers; and forming the paper-like sheet from the blend (col. 2 line 64 to col. 3 line 21; col. 9 line 59 to col. 11 line 47).

Yamamoto et al is silent on forming spacers on the paper-like sheet. In other words, Yamamoto is silent on making a pleated filter paper sheet. In addition, Yamamoto et al does not teach calendering the paper-like sheet using a profiled calender to form the pleated filter sheet. However, it would have been obvious in the art of making a filter media to form spacers on the paper-like sheet of Yamamoto (i.e. to form a pleater filter paper sheet) because it is notoriously

Art Unit: 1733

well known in the filter art to form a pleated filter sheet; and because Meyer discloses that *"It is already known that pleated filter papers and ... are also used mainly as air filters in the most varied forms. The advantage of large filter surfaces within the smallest of spaces, as well as low flow speeds as a result of the large filter surfaces are obvious"* (col. 1 lines 35-40) or Naruo et al disclose that *"The pleat-type filter cartridge has an advantage in that the area of the filtration membrane within a unit volume (effective filtration area) can be increased to thereby attain an enormous filtration flow rate per unit time. Therefore, the pleat-type filter cartridge is useful for large-scale filtration in the filed ..."* (col. 1 lines 23-39). Furthermore, it would have been obvious in the art to calender the paper-like sheet using a profiled calender to form a pleated filter sheet in the modified process of Yamamoto et al because: a) Yamamoto et al discloses that the paper-like sheet can be impregnated with resinous material, calendered, etc. (col. 5 lines 1-4); b) Norton discloses using a pair of profiled calender rollers to form a corrugated (pleated) paper filter; and c) it is well within the purview of choice in the art to chose from among the well known effective techniques of forming spacers on the paper filter sheet (i.e. pleated filter sheet).

Though not expressly disclosed by the above references, since the method recited in this claim is indistinguishable to the method taught by the art of record (i.e. appears to be identical), it is reasonably taken that, in calendering the paper-like sheet material of Yamamoto et al using a pair of profiled calender rolls, the fibrous web is bonded in a tension-free manner, without inhomogeneities over the cross-section of the cross-section of the fibrous web and without the use of flat bonding.

Art Unit: 1733

With respect to claims 2-4, Yamamoto et al discloses fuse-bonding the undrawn fibers at a low temperature range without using a bonding material (col. 3 lines 9-21). This teaching would have reasonably suggested to one in the art to heat the paper-like sheet at a temperature sufficient to soften/melt the undrawn fibers in order for the undrawn fibers to effectively function as binder fibers. In other words, during a calendering operation (whether heated or cooled calender rollers are used), one in the art would have ensured that, the paper-like sheet is sufficiently hot so that the undrawn fibers are soften/melted to effectively bond the fibers in the paper-like sheet. Therefore, it would have been obvious in the art to perform any one of the three alternative calendering methods recited in these claims in forming the corrugated (pleated) paper filter of Yamamoto et al because only the expected result of sufficiently softening/melting the undrawn fibers to effectively bond the fibers in the paper sheet would have been achieved in performing either one of the three alternative methods; and because one in the art would have chosen one from among limited effective known methods of calendering the fibrous web to successfully corrugate the paper filter of Yamamoto et al using a pair of profiled calender rollers.

Conclusion

3. In light of the amendment, the rejections set forth in the prior office action are withdrawn.
4. Spearman (5,250,179) is cited as further evidence that the art recognizes and appreciates the benefit of corrugating or pleating a filter material (col. 1 lines 21-27).

Art Unit: 1733

5. Dependent claim 8, directed to a device, is still pending. It is suggested to cancell this claim also.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Sam Chuan Yao** whose telephone number is (703) 308-4788. The examiner can normally be reached on Monday-Thursday from 8:00 AM-5:30 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mike Ball, can be reached on (703) 308-2058. The **fax number** in Group Art Unit 1733 for any official papers (i.e. papers that will be entered as part of the file wrapper) is (703) 305-7718 and for unofficial papers (e.g. proposed amendments) is (703) 305-7115.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0651.



Sam Chuan Yao
Patent Examiner
Art Unit 1733

scy
February 19, 1999